

Claims:

1. A method of manufacturing a starch-based pigment or filler, c h a r a c t e r i z e d in that
 - 5 – a solution comprising starch derivative is formed by dissolving starch derivative in a suitable solution,
 - the solution is brought into contact with a non-solvent in which starch derivative does not dissolve in order to precipitate the starch derivative from the solvent which results in a dispersion being generated, one which comprises a precipitate
 - 10 consisting of starch derivative, and a liquid phase, comprising both solvent and non-solvent,
 - the solvent is removed from the liquid phase, and
 - the precipitate is separated from the non-solvent, and recovered.
- 15 2. A method according to Claim 1, c h a r a c t e r i z e d in that a mixture of solvent and non-solvent is used as the solvent.
3. A method according to Claim 1 or 2, c h a r a c t e r i z e d in that only a quantity of solvent is used that is needed to dissolve the starch derivative, or, at the most, a quantity
- 20 which is 20 % by weight bigger than that.
4. A method according to any of the preceding claims, c h a r a c t e r i z e d in that a solution is formed which at least one of the following criteria can be applied to:
 - the concentration of the solution is at least 1 % by weight, preferably
 - 25 approximately 10-30 % by weight, and
 - the viscosity of the solution is 1-5 times the viscosity of water.
5. A method according to any of the claims 1-4, c h a r a c t e r i z e d in that a starch derivative is used, the glass transition point of which is at least 60 °C, preferably at least
- 30 100 °C, or which does not break down at the said temperature.
6. A method according to any of the claims 1-5, c h a r a c t e r i z e d in that starch ester is used as the starch derivative.

7. A method according to Claim 5, characterized in that the starch ester is an ester formed of starch and C₁₋₄ alkane acid, preferably a starch acetate.
8. A method according to Claim 6 or 7, characterized in that the starch ester is transglycosylated or hydroxy alkylated.
9. A method according to any of the preceding claims, characterized in that water, C₁₋₄ alkanol or a non-polar carbon hydride-based solvent is used as the non-solvent.
10. A method according to any of the preceding claims, characterized in that a straight-chain, branched or cyclic ketone or aldehyde is used as the solvent.
11. A method according to any of the preceding claims, characterized in that the degree of substitution of the ester groups of the esters functioning as starch derivatives is chosen in a way that the starch derivative is fundamentally insoluble in the non-solvent.
12. A method according to any of the preceding claims, characterized in that, after the removal of the solvent, the precipitate separated from the liquid phase does not contain such quantities of organic solvent residues which can be detected with a 300 MHz NMR device.
13. A method according to any of the preceding claims, characterized in that the solvent and the non-solvent is chosen in a way that they can be completely mixed with each other.
14. A method according to any of the preceding claims, characterized in that the quantity of non-solvent is approximately 0.1...100 times, preferably approximately 0.5...10 times, most suitably approximately 0.7...5 times the quantity of the solvent or solvent mixture, calculated by weight.
15. A method according to any of the preceding claims, characterized in that a non-solvent is added, while mixing, to a solution of starch derivative to produce spherical pigment particles.

- 16. A method according to Claim 15, c h a r a c t e r i z e d in that a pigment or filler product is prepared, one which comprises spherical pigments, the average particle size of which is approximately 90-1000 nanometres.
- 5 17. A method according to Claim 15 or 16, c h a r a c t e r i z e d in that the starch derivative is precipitated from the solution in two stages, which means that following precipitation with water and possible separation of the precipitate, the fines dispersed in the liquid phase are precipitated, for example using salting out.
- 10 18. A method according to any of the claims 1-15, c h a r a c t e r i z e d in that a starch derivative solution is added, while mixing, to a non-solvent to produce a coral-like, porous pigment product.
- 15 19. A method according to Claim 18, c h a r a c t e r i z e d in that a pigment or a filler product is prepared which comprises a material the particle size of which is approximately 1-100 micrometres and which has pores the average diameter of which is approximately 100-500 nanometres.
- 20 20. A method according to any of the preceding claims, c h a r a c t e r i z e d in that a solution comprising starch derivate is brought into contact with a non-solvent in turbulent conditions.
- 25 21. A method according to any of the preceding claims, c h a r a c t e r i z e d in that the quantity of the non-solvent is, depending on the solvent or the solvent mixture, generally 0.1...100 times, preferably approximately 0.5...10 times, most suitably approximately 0.7...5 times the quantity of the solvent or the solvent mixture (calculated by weight).
- 30 22. A starch-based pigment or filler product, c h a r a c t e r i z e d in that
 - it consists of a starch derivative, and
 - it comprises spherical starch derivative particles, the average particle size of which is approximately 90 - 1000 nanometres.
- 23. A pigment or a filler product according to Claim 22, c h a r a c t e r i z e d in that its ISO brightness is at least 80.

24. A pigment or a filler product according to Claim 22 or 23, characterized in that it is prepared using any of the methods according to Claims 1-21.

5 25. A pigment or a filler product, characterized in that

- it consists of a starch derivative, and
- it comprises a nanoporous, coral-like material, the particle size of which is approximately 1 - 100 micrometres.

10 26. A pigment or a filler product according to Claim 25, characterized in that it is prepared using any of the methods according to Claims 1 - 21.

27. A pigment or a filler product according to any of the Claims 25 - 26, characterized in that the starch derivative is a starch ester.

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28. A pigment or a filler product according to Claim 27, characterized in that the starch ester is an ester formed of starch and C₁₋₄ alkane acid, preferably starch acetate.

20 29. A pigment or a filler product according to Claims 27 or 28, characterized in that the starch ester is transglycosylated or hydroxy alkylated.

30. The use of a pigment or a filler product according to any of the Claims 22 - 29, in paper and cardboard production, in paints, in plastics, in rubbers and in cosmetic products, in hygiene products and/or in detergents.

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